

This Page Is Inserted by IFW Operations  
and is not a part of the Official Record

## **BEST AVAILABLE IMAGES**

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

**IMAGES ARE BEST AVAILABLE COPY.**

**As rescanning documents *will not* correct images,  
please do not report the images to the  
Image Problem Mailbox.**

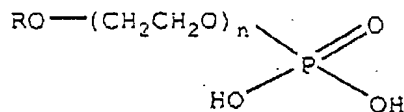
WHAT ARE CLAIMED ARE:

1. A ballpoint pen oil-based ink composition,  
comprising  
a coloring material,  
an oil-based solvent,  
at least one phosphoric acid ester having  
an acid value of 90 to 600, and  
at least one weakly cationic component  
selected from the group consisting of:

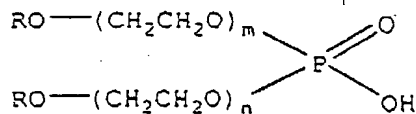
- a) imidazoline-type activator,
- b) polyoxyethylene alkylamine,
- c) polyoxyethylene alkylamide, and
- d) alkylalkanolamide.

2. The ballpoint pen oil-based ink composition  
according to claim 1, wherein said phosphoric acid ester  
comprises a phosphoric acid monoester, a phosphoric acid  
diester, a phosphoric triester or a mixture thereof, said  
phosphoric acid monoester, phosphoric acid diester and  
triester being represented by the following formula:

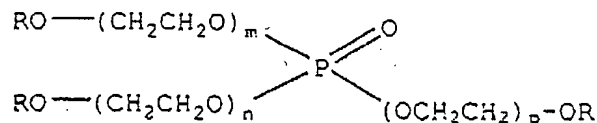
Monoester



Diester



Triester

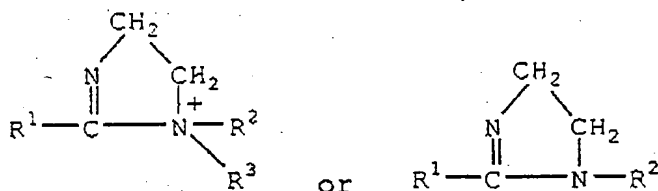


wherein

n, m, p: each an average addition molar number (n,  
m, p ≥ 0, preferably 10 ≥ n, m ≥ 0, p ≥ 0) of ethylene oxide; and  
R: each independently an alkyl group or  
alkylphenol group having from 3 to 30, preferably from 10

to 20, carbon atoms.

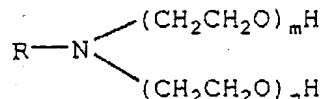
3. The ballpoint pen oil-based ink composition according to claim 1, wherein said imidazoline-type activator has a structure represented by the following formula or an imidazoline derivative:



wherein

- R<sup>1</sup>: H or an alkyl or alkylphenol group having from 1 to 30, preferably from 10 to 20, carbon atoms;  
 R<sup>2</sup>: a hydroxylalkyl group having from 1 to 30, preferably from 10 to 20, carbon atoms; and  
 R<sup>3</sup>: CH<sub>2</sub>COO<sup>-</sup>/carboxylate group.

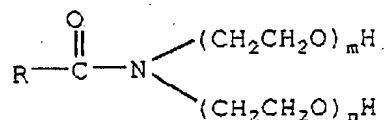
4. The ballpoint pen oil-based ink composition according to claim 1, wherein said polyoxyethylene alkylamine has a structure represented by the following formula:



wherein

- R: H or an alkyl or alkylphenol group having from 1 to 30 carbon atoms; and  
 n, m ≥ 1, preferably n, m ≥ 2, more preferably n, m ≥ 5.

5. The ballpoint pen oil-based ink composition according to claim 1, wherein said polyoxyethylene alkylamide has a structure represented by the following formula:



wherein

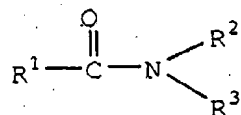
- R: H or an alkyl or alkylphenol group having from 1

10026799.122701

to 30 carbon atoms; and

$n, m \geq 1$ , preferably  $n, m \geq 2$ , more preferably  $n, m \geq 4$ .

6. The ballpoint pen oil-based ink composition according to claim 1, wherein said alkylalkanolamide has a structure represented by the following formula:



wherein

$\text{R}^1$ : an alkyl or alkylphenol group having from 1 to 30 carbon atoms, preferably from 10 to 20 carbon atoms;

$\text{R}^2$ : H or an alkyl or hydroxyalkyl group having from 1 to 30 carbon atoms, preferably from 10 to 20 carbon atoms; and

$\text{R}^3$ : H or an alkyl or hydroxylalkyl group having from 1 to 30 carbon atoms, preferably from 10 to 20 carbon atoms.

7. The ballpoint pen oil-based ink composition according to claim 1, wherein said phosphoric acid ester is contained in an amount of 0.1 to 15.0% by weight of the composition.

8. The ballpoint pen oil-based ink composition according to claim 1, wherein said weakly acid component is contained in an amount of 0.1 to 15.0% by weight of the composition.

9. The ballpoint pen oil-based ink composition according to claim 1, wherein said oil-based solvent comprises as a main solvent, at least one solvent selected from the group consisting of alcohols, polyhydric alcohols and glycol ethers each having a vapor pressure at 25°C of 0.001 mmHg or more.

10. The ballpoint pen oil-based ink composition according to claim 1, wherein said oil-based solvent comprises as a main solvent, at least one solvent selected from the group consisting of alcohols, polyhydric alcohols and glycol ethers each having a vapor

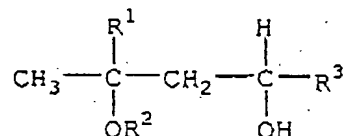
100265799-122701

pressure at 25°C of 0.01 mmHg or more.

11. The ballpoint pen oil-based ink composition according to claim 1, further comprising a resin in an amount of 1 to 30% by weight of the composition.

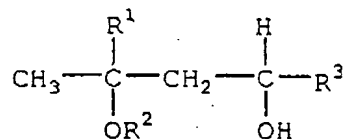
12. The ballpoint pen oil-based ink composition according to claim 1, wherein said oil-based solvent comprises a solvent having a chemical structure represented by  $C_nH_{2n-1}OC_3H_7OH$  where n is an integer of 1 to 3 as a main solvent and an auxiliary solvent having a vapor pressure lower than that of said main solvent and having a viscosity of 1 to 50 mPa·s, said ink composition further comprises a resin soluble in at least one of said main and auxiliary solvents, said ink composition having a viscosity of 800 to 10,000 mPa·s at 25°C.

13. The ballpoint pen oil-based ink composition according to claim 1, wherein said oil-based solvent comprises a propylene glycol monoethyl ether and one or more compounds having the following chemical formula:



where  $R^1$ ,  $R^2$  and  $R^3$  each is independently H or  $CH_3$ , said ink composition further comprises a resin soluble in said mixed solvent, said ink composition having a viscosity of 800 to 6,000 mPa·s at 25°C.

14. The ballpoint pen oil-based ink composition according to claim 1, wherein said oil-based solvent comprises one or more compounds having the following chemical formula:



where  $R^1$ ,  $R^2$  and  $R^3$  each is independently H or  $CH_3$ , said ink composition further comprises a resin soluble in said solvent, said ink composition having a viscosity of

10026799.122701

700 to 8,000 mPa·s at 25°C.

5 15. A ballpoint pen comprising an ink holder, the ballpoint pen oil-based ink composition according to claim 1 in said ink holder, and an ballpoint pen tip provided at an end of the ink holder.

16. The ballpoint pen according to claim 15, further comprising an ink follower provided in said ink holder at another end of the ink composition opposite to the ballpoint pen tip.

10 17. The ballpoint pen according to claim 15, wherein said ballpoint pen tip comprises a ceramic micro ball.

10026799.122701